

SUBSCRIBER SETS

685-, 686-, 687-, 688-, 690-, 696-,]690-
AND 2690-TYPES

This index lists the information that forms a part of, or supplements this specification, and indicates the authorized issues thereof.

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c—Information in accordance with that currently authorized.

Western Electric Filing Information:
File in Handbook RS-560, Bk-2, Tab A
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DATE					12-80														
NUMBER	ISSUES AUTHORIZED ON ABOVE DATE																		TITLE
SUPL DWGS																			
A-567928	c																		685B - Assembly
A-567929	c																		685B - Wiring
A-579461	c																		688A, B - Assembly
A-579463	c																		688A - Wiring
A-579598	c																		690A1, A2, B1, B2, C1, C2 - Assembly
A-579600	c																		690A1, A2, A3-Wiring
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A-580142	c																		685C - Assembly
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A-580473	c																		688B - Wiring
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A-580488 -				c															2690-1690C1 - Assembly
A-580489				c															2690-1690C1, C2, C3-Wiring
A-580498				c															2690-1690C2-Assembly
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A-580532		c																	688C-Assembly and Wiring
A-580860				c															696 - Assembly
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LA-776898	c																		685A, 686A - Assembly
LA-776899	c																		687A - Assembly
LA-776900	c																		687A - Wiring
LA-776901	c																		687B - Assembly
LA-776902	c																		687B - Wiring
LA-776903	c																		685A - Wiring
LA-776904	c																		686A - Wiring

c-Information in accordance with that currently authorized.

1. GENERAL

1.01 This specification covers the requirements for the recovery of the 685A, B, C; 686A, 687A, B, D; 688A, B, C; 690A1, A2, A3; 690B1, B2, B3; 690C1, C2, and C3; 1690C1, C2, C3; 2690C1, C2, and C3 Subscriber Sets.

1.02 The applicable requirements of the specifications listed on the index as SUPL SPECS shall be followed in the recovery of the subscriber sets in addition to the requirements given herein.

Requirements Needing Special Consideration by Telephone Company

1.03 This specification includes certain requirements which need special consideration and, in some cases, action on the part of the telephone company. The paragraph numbers and a brief description of these requirements are shown in the following table:

<u>Paragraph No.</u>	<u>Requirement</u>	←
3.01	Omitted on Issue 11	
3.02	Conversion of 688A and 690A sets to 688B and 690B sets respectively	

2. APPROVED STANDARDS

2.01 Omitted on issue 7 of this page. (Included in BSRS-350.001)

General

3.01 Omitted on Issue 11. (Covered 3.23A) ←

3.02 Unless otherwise specified by the telephone company, 688A and 690A sets shall be converted to 688B and 690B sets respectively.

3.02A All 685D subscriber sets shall be converted to 685A type.

Appearance, Cleaning, and Finish

3.03 Omitted on issue 7 of this page. (Included in BSRS-350.001)

- 3.03A Sets shall be reissued in the following finishes:
- (a) 685A, B Sets - Black (-3), light olive gray (-49), green (-51) or beige (-60), as required.
 - (b) 685C Sets - light olive gray (-49)
 - (c) Omitted on Issue 7 of this page
 - (d) 686-, 687-, 688-Type Sets - light olive gray (-49)

- 3.04 Exterior surfaces of covers may be made to meet the appearance standards by any of the following means:
- (a) Buffing
 - (b) Cleaning with KS-14427 Cleaning Emulsion or with a "Soap and Water Solution"
 - (c) Refinishing black covers with an approved "black lacquer for Thermoplastic Apparatus" and covers in color with an approved "Acrylic Lacquer" of the colors specified in 3.03A.

3.05 The interior of the set shall be cleaned.

3.05A Faceplates may be made to meet the appearance standards by cleaning with KS-14427 Cleaning Emulsion or an approved "detergent solution."

Cover

3.06 The cover shall be capable of being locked.

3.07 The cover lockscrews shall not fall out of the cover lock-screw holes when the cover is shaken while held upside down with the screws in a vertical plane and free to fall of their own weight.

NOTE: In removing and replacing cover lockscrews, the screws shall be threaded through the lockscrew holes.

Terminal Block Assembly

3.08 On the terminal block assembly, terminal screws and washers shall be present on unconnected terminals, and terminal designations shall be legible.

3.08A A 1" long X 1/2" wide pressure sensitive adhesive tape shall be assembled to the base plate, beneath strapped terminal G of the terminal block assembly of the 685A-, 686A-, 687A-, and 687B- Type Subsets. ←

- 3.09 Parker Kalon self-tapping screws, type Z (No. 6-20 by 1/4 inch long), or equivalent, shall be used to replace terminal screws that are missing from tapped holes having stripped threads.
- 3.10 Omitted on issue 2 of this page.
- 3.11 Omitted on issue 2 of this page. (Included in BSRS-350.001).
- 3.12 Illegible terminal designations shall be re-marked with white or silver "Printers Ink," or equivalent.

Wiring

- 3.13 Wiring shall not have insulation so frayed or damaged that bare wire might touch adjacent terminals, wires, base, or apparatus.
- 3.14 Wires may be cut back or replaced.
- 3.15 Omitted on Issue 2 of this page. (Included in BSRS-350.001).
- 3.16 When wires are replaced, PVC-type wire of the color indicated in the applicable drawings shall be used. Replaced wires to be used for connection to screw terminals shall be equipped with solderless cord tips.
- 3.17 Wires shall be dressed to allow access to terminal screws for external connections and to clear moving parts and ringer gongs.
- 3.18 Omitted on Issue 4 of this page.

Varistor

- 3.19 If the seal between the clamping screwhead and the washer or between the clamping nut and the washer of the 20A Varistor is cracked or broken to an extent indicating that the clamping screw or nut may have been tightened or loosened, the varistor shall be replaced. Small chips in the finish on other parts of the varistor are permissible.

Note: In soldering or unsoldering leads at the varistor, care shall be exercised to reduce to a minimum the heating of the varistor.

- 3.19A All 687B Subscriber Sets shall be equipped with either:
- a) 20A Varistor, or
 - b) A series combination of a 446F Diode and a $100 \pm 20\%$ 1/2 watt resistor, or
 - c) If the 446 F Diode is found to be defective, a series combination of a 533K Diode and a $100 \text{ ohm} \pm 20\%$, 1/2 watt resistor is to be used.

NOTE: When resistor diode combination is used, it shall be insulated with heat shrinkable PVC tubing or equivalent. To prevent diode seal breakage and internal heating from solder operation, bend leads of diode at least 0.080 inches from body of diode.

Relays

3.20 A UA112 Relay which has visible rust spots on the surface of the pole-face end of the core, on the surface of the armature adjacent to the pole-face end of the core, or on the surface of the armature that comes in contact with the adjusting nut, shall be replaced. Other exposed metal surfaces shall be free of rust.

3.20A An S36 Relay which has visible rust spots on the pole face end of the core or on the surface of the armature adjacent to the pole face end of the core shall be replaced; other exposed metal surfaces shall be free of rust.

3.21 Exposed metal surfaces of the relay from which rust has been removed or on which the protective finish has been damaged shall have the bare areas touched up with "Clear lacquer." Tarnish or surface discoloration, however, is permissible.

3.21A The KS-19132 Relay in the 685-C Subset shall be converted to the MA4 Relay using the D180892 Kit of Parts.

3.22 The relay coil cover shall not be badly damaged. Slight tears, small holes, and frayed edges in the outer cover shall be repaired with "Noninflammable Cellulose Acetate Cement."

Tube

3.23 Badly scratched areas in the opaque coating on the tube or bare spots larger than an area of approximately 1/16 square inch shall be retouched with "black lacquer."

3.23A The 425A electron tube may be used as a replacement for the 426A electron tube in all applications. All station apparatus returned for repair and/or recovery, and normally factory equipped with a 426A electron tube, may be returned to "C" stock with a 425A tube. The 425A tube shall be wired for a negative ring station as depicted in BSP-500-112-100.

Ringer Volume Adjusting Arm and Control Wheel

3.24 It shall be possible to operate the adjusting arm or control wheel (throughout its complete range of movement) with a force that can be readily applied by the fingers.

3.25 The operation of the arm or control wheel shall turn the moveable gong of the ringer to the four conditions of volume output, that is from high to low or low to high.

3.26 Omitted on Issue 3 of this page.

3.27 The arm, if present, shall be locked by the stud in the loudest volume position.

If arm is damaged, remove it and its associated trimount push rivet as well as tubular rivet 302978825. None of the items removed need to be replaced.

3.28 Sets shall have C4A Ringers with new style frames.

NOTE: The significant difference between new-and old-style frames is shown on B-921733. Ringers bearing a manufacturing date prior to 1-55 are the ones most likely to have an old-style frame. If the ringer has an old-style frame, it is possible for the volume-control arm to become locked in the lowest volume position.

Bezel and Faceplate - 690-, 1690-, and 2690-Type Sets

3.29 The clips on the back of the bezel shall be in such condition that the bezel will snap firmly into place when it is being assembled to the frame assembly.

Bezel and Faceplate - 690-, 1690- and 2690-Type Sets (Cont'd.)

3.30 The glare-reducing surface shall be of uniform texture and be such as to permit seeing characters and letters on the faceplate mat and number plates clearly without blurring or distortion. When required, a mixture of equal parts of No. 75-80 flat, clear, acrylic lacquer and No. 75-40A Clear Acrylic Lacquer obtainable from American Lacquer Solvents Co., Phoenixville, Pa., or equivalent shall be applied.

Network - 690- and 2690-Type Subset

3.31 Mylar electrical tape, RM-900372731 1" wide X 2-1/2" long, is to be used to insulate varistors of the 4228F Network from base of subset and thereby prevent electrical breakdown.

4. TESTS AND ADJUSTMENTS

4.01 Omitted on Issue 3 of Page 5. (Included in BSRS-350.001).

Breakdown Test

4.01A The current that flows when a potential of 1000V RMS 60Hz is applied between simplexed external line connections (exclude ground if it is common to surface being tested) and conductive exposed surfaces shall be in accordance with X-17986.

Insulation Resistance

4.02 The insulation resistance of the 198C and 548C Capacitors and the ringing capacitor in the 425-Type Networks shall not be less than 1 megohm.

687B Set

4.03 With 90 volts ac (20 cycles per second), $5600 \pm 10\%$ ohm resistance, and 24 volts dc connected in series across terminals L2 and G, the UA112 Relay shall operate when the positive side of the dc source is toward the G terminal and shall not operate when the negative side is toward G.

NOTE: This test shall be made with the Subscriber Set mounted in the vertical position.

241B Network

4.04 If the 688- or 690- Subset is equipped with a 241B Network visually check correctness of lead assembly connections between the amplifier and network.

4.08A The S36 Relay shall meet the following requirements:

<u>Armature Travel</u>	<u>Operate</u>	<u>Nonoperate</u>
0.010 ± 0.001 inch	0.0445 ampere	0.0395 ampere

NOTE: The operate adjustment shall be made by slowly increasing the current to 0.0445 ampere using a battery of not less than 3 volts.

4.08B If the S36 Relay fails to meet the above operate and non-operate requirements, it shall be checked for the mechanical requirements shown in the following subparagraphs:

- (a) The armature of S36 Relay shall work freely on its pivot and shall not rub against the core or frame of the relay.
- (b) The front and back contact screws and the retractile spring screw of S36 Relay shall be sufficiently tight in their respective brackets to hold in any adjustable position.
- (c) Points of contact screws of S36 Relay shall rest within the surface of their respective contact springs.

4.08C The KS-19132, List 2 Relay shall operate on 0.020 ampere and release on 0.002 ampere.

4.08D If the KS-19182, L2 Relay is inoperative, replace relay with a MA4 Relay.

Varistor

4.09 The 20A Varistors shall meet the 54-volt dc test voltage requirements in Table G of BSRS-420.901. When testing the varistor, any shunt path around it should be disconnected. Wherever possible, the circuit shall be opened at the shunting apparatus rather than at the varistor.

NOTE: For testing, it is important that the voltmeter be so connected as to accurately read the voltage at the terminals of the varistor without error due to other voltage drops in the circuit.

Ringer and Tube

4.10 The requirements in BSRS-362.114 for testing the C4A Ringer and the C4A Ringer in conjunction with the tube shall apply to the subscriber sets covered in this specification.

4.10A The C4A Ringer shall be equipped with a RS-9164 Clip.

Network and Amplifier (688C, 690C, and 1690C, 2690C-Type Sets)

4.13 With 3 to 6 volts dc applied across terminals C and F of the network, (terminals F and RR of the network strapped on 688C Sets), and a G1A Handset, or equivalent, connected as shown below, sidetone shall be heard in the receiver when the transmitter is spoken into in a normal manner. Under the same conditions except that a strap is connected across the emitter resistor of the 241A Amplifier, the sidetone level shall increase. This requirement shall also be met when the polarity of the applied voltage is reversed.

Handset Lead	Connect to
	688C-, 690C-, 1690C- and 2690C-Type Sets
Red	Term. 3 of amplifier
Black	Term. 2 of amplifier
White	Term. 1 of amplifier
White	Term. GN of Network

4.14 The KS-8109 Buzzer shall meet the test requirement specified in BSRS-455.131.

4.15 Omitted on Issue 2 of this page.

4.16 685B, 686C, 687A Type Sets

With the ringer in high notch bias, when a signal of $90 \text{ V} \pm 1\%$ at $20 \text{ Hz} \pm 1\%$ is applied to the set through a $3.3\text{K} \text{ ohm} \pm 1\%$ resistor (including source impedance) the ringer shall exhibit a steady (or uninterrupted) two-gong ring in high volume.

5. MARKING AND PACKING

5.01 Omitted on Issue 4 of this page. (Covered in BSRS-350.001.)

- 5.02 Omitted on issue 7 of this page; covered in BSRS 350.001.
- 5.03 Circuit labels need not be provided with the sets.
- 5.04 A set of five faceplate mats shall be furnished with each 690AL, B1 and 1690C1 set. The mats shall be of the following colors; dull gold, blue, green, cream white, and silver.
- 5.04A A dull gold and a silver mat shall be furnished as separate items with each 2690C1 type set.
- 5.05 Four P-205552 screws and one P-14E456 plate shall be furnished as separate items with each 690A2, B2, C2, 1690C2 and 2690C2 set.
- 5.06 Eight P-43A376 screws shall be furnished as a separate item with each 690A3, B3, C3, 1690C3 and 2690C3 set.

6. REPLACEMENTS

- 6.01 Defective 425B networks may be replaced by 425E or 4228-Type networks; defective 425E networks are to be replaced by 4228 Type networks. ←
- 6.02 When a Mylar constructed 198C capacitor (wrapped type) is used in a 687A subscriber set which has the old-style clip, a wood spacer (or equivalent) 1/8 to 3/16 inch thick, 1/2 to 5/8 inch wide, and 5/8 to 1-1/4 inches long shall be mounted on top of the capacitor and located centrally underneath the clip.

NOTE: The significant differences between the old- and new - style clips are shown on B-924999.